TABLE E.—Cases Examined at Operation or Autopsy.

	Total.	Negative "C" reaction.	Positive "C" reaction.
Pancreas normal to palpation	22	20	2
Chronic interstitial pancreatitis	18	11	7
Acute exacerbation	1	0	1
Cyst of the pancreas	1	1	0
Carcinoma of the pancreas	1	1	0
	43	33	10

CONCLUSIONS. Our fifteen months of experience with the Cammidge "C" reaction in the German Hospital have led us to believe that it has a very limited value. A negative reaction does not indicate that the pancreas is normal, for negative results have been obtained in acute and chronic pancreatitis, carcinoma of, and cyst of the pancreas. Further, a positive reaction is not pathognomonic of pancreatic disease, as the reaction is found to be positive in some cases in which there is no evidence, even to direct palpation, that the pancreas is not normal. However, if history, physical examination, and examination of the feces point to the presence of a pancreatic lesion, we consider a positive Cammidge "C" reaction to be of value in completing the diagnosis. In other words, very little dependence can be put upon a negative reaction, and a positive reaction can only be considered of value as a confirmatory examination.

Most of the cases are from the service of Dr. John B. Deaver, surgeon-in-chief to the German Hospital, and I am indebted to him for access to the records. Also I wish to thank Dr. A. O. J. Kelly, chief of the Pathological and Bacteriological Department, for permission to make this report from the laboratory. The reactions have been performed by the resident physicians in their laboratory service, Dr. Kinard, Dr. Herman, Dr. Weber, Dr. Shoudy, and myself.

THE DETERMINATION OF CHLORINE AND THE PURIN BODIES IN URINE.

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It is well and widely known that the procedures at present in vogue for estimating the purin bodies (uric acid) in the urine are either (1) tiresomely tedious, or (2) woefully inaccurate. No apologies, therefore, are called for in submitting an original method which (*a*) saves much time, and (*b*) gives accurate results. The method given below for the determination of chlorine has obvious advantages over those in general use. It is included in this paper mainly because the same solutions, practically, are required for the chlorides as for the purin bodies.

Solutions Required. 1. *Alkaline Starch Solution.* Mix 20 grams of corn starch with 250 c.c. of distilled water. To 750 c.c. of distilled water add 50 c.c. of 10 per cent. aqueous solution of sodium hydroxide and heat to boiling. Gradually add the starch mixture and allow to boil gently for five or ten minutes. Cool in running water.

2. *Sodium Nitrite Solution.* Dissolve 10 grams of the salt in 500 c.c. of distilled water.[1]

3. *Magnesia Mixture.* Dissolve 100 grams each of magnesium sulphate and ammonium chloride in 800 c.c. of distilled water and add 100 c.c. of strong ammonia water.

4. *Decinormal Silver Nitrate.* Dissolve 16.88 grams of pure crystallized silver nitrate in about 800 c.c. of distilled water to which has been added 10 c.c. of chemically pure concentrated nitric acid. Make the volume up to one liter.

5. *Decinormal Potassium Iodide.* Dissolve 20 grams of potassium iodide and 2 or 3 grams of sodium hydroxide in about 1100 c.c. of distilled water.[2] This solution will require diluting after ascertaining its value by titrating against the silver solution.[3] This solution will usually be sufficiently accurate for all clinical purposes if made by dissolving 16.6 grams of potassium iodide and 2 or 3 grams of NaOH in enough distilled water to make one liter.

Determination of the Purin Bodies. To 100 c.c. of the urine add 10 c.c. each of the magnesia mixture, sodium nitrite solution, and strong ammonia water. Dilute about 1 c.c. of the alkaline starch solution with about 10 c.c. of distilled water and add 1 c.c. of chemically pure concentrated nitric acid.[4] With a rubber bulb pipette place six or eight large drops, at intervals, on a piece of glass laid upon a sheet of white paper. From the burette add the decinormal KI solution to the urine mixture until a drop of it when placed in contact with the starch indicator gives a decided blue color.[5] When the reaction is obtained add to the urine mixture 7 c.c. of the decinormal silver solution and filter through a well-moistened paper. Filtration is fairly rapid and the filtrate comes through perfectly clear. Wash the precipitate with a small amount of distilled water to which a little ammonia has been added. To the filtrate and washings is then added the decinormal KI solution until a drop of the mixture, when brought in contact with a drop of the indicator, gives a faint blue color, showing that the excess of silver has all been precipitated as silver iodide. The number of c.c. of the KI solution added—ignoring that used in the first step—is deducted from 7 (the number of c.c. of the silver solution used), and the remainder multiplied by 0.0168. This gives the percentage of the purin bodies (as uric acid).[6]

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[1] I have not found it necessary to use the chemically pure sodium nitrite. The commercial salt usually contains traces of chloride, etc., but if the decinormal solutions are standardized in the presence of these impurities no error will be introduced by them in future work.

[2] The sodium hydroxide is added to prevent separation of free iodine on long standing.

[3] The KI solution is standardized as follows: In a flask place 10 c.c. of the silver solution with 1 or 2 c.c. of chemically pure concentrated nitric acid and dilute to about 200 c.c. with distilled water. Add 5 c.c. each of the starch and sodium nitrite solutions. Now from the burette run in the KI solution until, after agitating, a permanent blue color remains. The reactions occurring are as follows. On adding the nitrite solutions nitrous acid is liberated. This decomposes the KI, and the free iodine, or a portion of it, combines with the starch to form the well-known blue iodide of starch, which in turn is immediately decomposed by the silver nitrate with precipitation of insoluble silver iodide. When all the silver has been precipitated the slightest excess of free iodine (KI) gives a permanent blue compound with the starch. The process should be repeated, and from the data obtained the KI solution may be diluted so that it will exactly correspond with the silver solution.

[4] The acid should not be added to the starch solution until after it has been diluted with the water.

Determination of Chlorine. To 5 c.c. of the urine contained in a small beaker add 1 or 2 c.c. of chemically pure concentrated nitric acid followed by 15 c.c. of the decinormal silver solution. Filter through a well-moistened paper. Filtration is rapid and the filtrate perfectly clear. Wash the precipitate with a few c.c. of distilled water. Dilute the filtrate and washings to about 200 c.c. with distilled water and add about 5 c.c. each of the alkaline starch and sodium nitrite solutions. Run in the KI solution from the burette until, after agitating, a permanent blue color remains. Should an excess of the KI solution be added inadvertently, an additional c.c. of the silver solution may be added and the titration continued more cautiously until the desired end reaction is obtained. Deduct the number of c.c. of the KI solution required from the number of c.c. of the silver solution used and multiply the remainder by 0.071 for the percentage of chlorine, or by 0.117 for the percentage of chlorine expressed as sodium chloride.[7] I have used the method extensively during the last year or so and have found it exceedingly accurate. For the benefit of those who may have occasion to try it the following suggestions are offered:

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[5] It is convenient to use a rubber bulb pipette as a stirring rod. It will usually requier from 0.3 to 0.4 c.c. of the KI solution to bring about the reaction.

[6] A very satisfactory method for making this titration is to add the KI solution 1 c.c. at a time until the end reaction is obtained. Then add an additional c.c. of the silver solution. The KI solution can now be added more intelligently—knowing that less than 1 c.c. will be required. In this case the number of c.c. of the KI used must, of course, be deducted from 8.

[7] This method for estimating chlorine has practically the same field of application as Volhard's, over which it is thought to have the advantage of a sharper, more delicate, definite, and easily recognized end-reaction. It is not interfered with by salts of lead, copper, zinc, cadmium, antimony, arsenic, bismuth, cobalt, nickel, chromium, manganese, magnesium, calcium, iron, etc. The only metallic salts that are known to interfere are those of mercury. These also interfere with the sulphocyanide method of Volhard.

1. The volume of fluid being titrated for excess of silver may range between 100 and 1000 c.c. It is preferable, however, that it be from 200 to 500 c.c.

2. The quantity of free nitric acid present may range from 0.25 to 5 per cent. Better results are obtained when the variation is from 0.5 to 1 per cent.

3. The quantity of silver to be precipitated should not, preferably, exceed 25 c.c. There is no reason why this condition should not always be present. Very large precipitates of silver iodide render the end-reaction less delicate; otherwise, the quantity of silver would probably have no effect on the accuracy of the results.

4. The amount of sodium nitrite present may vary from 0.1 to 0.2 gram. The former amount—5 c.c. of a 2 per cent. solution—is preferable.

5. The amount of the starch solution used—if not too old—is immaterial; 5 c.c. should suffice in all cases.

6. The indicator for chlorides may be prepared by mixing equal parts of the alkaline starch, and the sodium nitrite solutions. Of this, 10 c.c. is used for each titration. The mixed solutions will probably keep as well as when kept separately.

7. The alkaline starch solution to be used as indicator for chlorides will remain unaltered for about three months. After this time gradually occurring changes will introduce a slight error unless guarded against. If the decinormal solutions are standardized by using a freshly made starch solution, so that 10 c.c. of the one equals 10 c.c. of the other, it will be found after the starch solution has been kept for several months that 10 c.c. of the silver will require more, say 10.1 c.c. of the KI solution. This difficulty may be overcome (*a*) by using starch solutions not more than three or four months old, or (*b*) checking the KI solution against the silver solution every three months and noting the correct factor on the label. In this way the starch solution will give accurate results after keeping for longer than a year.

REVIEWS.

Anatomy, Descriptive and Applied. By Henry Gray, F.R.S., Fellow of the Royal College of Surgeons; Lecturer on Anatomy at St. George's Hospital Medical School, London. Eighteenth edition. Thoroughly revised and reëdited, with additions, by Edward Anthony Spitzka, M.D., Professor of General Anatomy in the Jefferson Medical College, Philadelphia. Pp. 1496; 1208 engravings. Philadelphia and New York: Lea & Febiger, 1910.

It is needless to say that any medical work which has passed through eighteen editions and has long survived the death of its author, owing not only to the intrinsic merit of his original work, but also to the able editors who from time to time have revised and reëdited it, must be a book of much value to the medical practitioner and to the medical student. This opinion is fully borne out by a careful examination of the present edition of *Gray's Anatomy*, the title of which has been changed from "Anatomy, Descriptive and Surgical" as in previous editions, to "Anatomy, Descriptive and Applied." This has permitted enlarging the scope of the work and allowing the editor to add much useful information by applying our anatomical knowledge to medicine as well as to surgery. And of this he has skillfully availed himself, thereby adding much to the practical usefulness of the book. Examples of such additions will, of course, be found in the sections on the pericardium, heart, pleura, and lungs, but they are by no means limited to these subjects, being found scattered throughout the work in the sections devoted to applied anatomy. A careful study of these sections will show that this edition contains under this caption all that is usually found in works devoted exclusively to applied anatomy.

The editor has rearranged much of the matter of the work, advantageously joining in the same section allied subjects which have hitherto been widely separated. Thus we find the description of the male and female perineum has been placed in the section devoted to the perineal muscles, and the article on hernia in the section devoted to the intestines, instead of appearing in the back of the book as has heretofore been the case with each of these subjects. Several paragraphs descriptive of the thorax have been